

CLAIMS

What is claimed is:

- 1 1. A system, comprising:  
2 a spontaneous data communication network having:  
3 a set of mobile units, wherein each mobile unit in the set of mobile  
4 units includes a router to transmit and receive data packets from any other mobile  
5 unit in the set of mobile units, wherein at least one mobile unit includes an  
6 antenna in a light.  
1
- 1 2. The system of claim 1, wherein each router is a home router to store and  
2 adjust home potentials of the home router, to receive and store neighbor potentials  
3 of neighboring routers, to determine ideal data packet flows using the home and  
4 neighbor potentials with an optimization of at least one of a merit function or a  
5 penalty function involving stochastic changes in topology in the spontaneous data  
6 communication network, and to receive and route data packets based on the home  
7 and neighbor potentials.  
1
- 1 3. The system of claim 1, wherein each router implements at least one of an  
2 Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Routing  
3 Information Protocol (RIP), or Transport Control Protocol/Internet Protocol  
4 (TCP/IP).  
1
- 1 4. The system of claim 1, further comprising a set of stationary units, wherein  
2 each stationary unit in the set of stationary units includes a router to transmit and  
3 receive data packets from any other stationary unit in the set of stationary units or  
4 any other mobile unit.  
1

1 5. The system of claim 4, wherein each antenna transmits and receives data  
2 on at least one of an optical carrier, a radio frequency (RF) carrier, a microwave  
3 carrier, or an infrared (IR) carrier via free space.

1 6. The system of claim 5, wherein each router implements at least one of an  
2 Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Routing  
3 Information Protocol (RIP), or Transport Control Protocol/Internet Protocol  
4 (TCP/IP).

1 7. A system, comprising:  
2 a spontaneous data communication network having:  
3 a set of stationary units, wherein each stationary unit in the set of  
4 stationary units includes a router to transmit and receive data packets from any  
5 other stationary unit in the set of stationary units, wherein each router is a home  
6 router to store and adjust home potentials of the home router, to receive and store  
7 neighbor potentials of neighboring routers, to determine ideal data packet flows  
8 using the home and neighbor potentials with an optimization of at least one of a  
9 merit function or a penalty function involving stochastic changes in topology in  
10 the spontaneous data communication network, and to receive and route data  
11 packets based on the home and neighbor potentials.

1 8. The system of claim 7, wherein each router implements at least one of an  
2 Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Routing  
3 Information Protocol (RIP), or Transport Control Protocol/Internet Protocol  
4 (TCP/IP).

1 9. The system of claim 7, wherein at least one stationary unit in the set of  
2 stationary units includes furniture.

1 10. The system of claim 7, wherein at least one stationary unit in the set of  
2 stationary units includes equipment.

1 11. An apparatus, comprising:  
2 a vehicle having:  
3 an antenna located in a headlight or a taillight; and  
4 a transceiver coupled to the antenna, the transceiver having a router to  
5 transmit and receive data packets.

1 12. The system of claim 11, wherein each router is a home router to store and  
2 adjust home potentials of the home router, to receive and store neighbor potentials  
3 of neighboring routers, to determine ideal data packet flows using the home and  
4 neighbor potentials with an optimization of at least one of a merit function or a  
5 penalty function involving stochastic changes in topology in the spontaneous data  
6 communication network, and to receive and route data packets based on the home  
7 and neighbor potentials.

1 13. The system of claim 7, wherein each router implements at least one of an  
2 Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Routing  
3 Information Protocol (RIP), or Transport Control Protocol/Internet Protocol  
4 (TCP/IP).

1 14. An apparatus, comprising:

2 a stationary unit having:

3 an antenna; and

4 a transceiver coupled to the antenna having a router to store and  
5 adjust its potentials, to receive and store a secondary set of potentials of routers in  
6 a secondary set of routers, to determine ideal data packet flows using the  
7 potentials with an optimization of at least one of a merit function or a penalty  
8 function involving stochastic changes in topology in a spontaneous data  
9 communication network, and to receive and route data packets based on the  
10 potentials.

1  
1 15. The apparatus of claim 14, wherein the stationary unit is at least one of a  
2 piece of furniture or equipment.

1  
1 16. The apparatus of claim 15, wherein the stationary unit is at least one of a  
2 road sign, an overpass, a bridge, a stoplight, a computer, a desk, a credenza, a  
3 cabinet, a telephone, a chair, a printer, a copier, a lamp, a light fixture, a  
4 thermostat, a computer, an architectural structure, a milling machine, a lathe, a  
5 drill press, a tool, a toolbox, a parts washer, a forklift, or a workbench.

1  
1 17. The apparatus of claim 14, wherein each antenna transmits and receives  
2 data on at least one of an optical carrier, a radio frequency (RF) carrier, a  
3 microwave carrier, or an infrared (IR) carrier via free space.

1 18. A method, comprising:  
2 transmitting data packets into free space from an antenna in at least one of  
3 a first vehicle headlight or taillight;  
4 routing the data packets to at least one of a second vehicle headlight or  
5 taillight, a road sign, an overpass, a bridge, a stoplight, or a building; and  
6 receiving the data packets from free space at an antenna in at least one of  
7 the second vehicle headlight or taillight, the road sign, an overpass, a bridge, a  
8 stoplight, or a building.

1  
1 19. The method of claim 18, wherein transmitting data packets into free space  
2 from an antenna in at least one of a first vehicle headlight or taillight and  
3 receiving the data packets from free space at an antenna in at least one of the  
4 second vehicle headlight or taillight, the road sign, an overpass, a bridge, a  
5 stoplight, or a building comprises transmitting and receiving data packets on at  
6 least one of an optical carrier, a radio frequency (RF) carrier, a microwave carrier,  
7 or an infrared (IR) carrier via free space.

1  
1 20. The method of claim 18, wherein routing the data packets to at least one of  
2 a second vehicle headlight or taillight, a road sign, an overpass, a bridge, a  
3 stoplight, or a building comprises at least one of receiving, storing, or adjusting  
4 potentials to determine ideal data packet flows with an optimization of a merit  
5 function or a penalty function involving stochastic changes in topology in a  
6 spontaneous data communication network, and routing data packets based on the  
7 potentials.

1  
1 21. The method of claim 20, wherein routing the data packets to at least one of  
2 a second vehicle headlight or taillight, a road sign, an overpass, a bridge, a  
3 stoplight, or a building comprises implementing at least one of an Open Shortest  
4 Path First (OSPF), Border Gateway Protocol (BGP), Routing Information  
5 Protocol (RIP), or Transport Control Protocol/Internet Protocol (TCP/IP).

1

1 22. A system, comprising:

2 a spontaneous data communication network having:

3 a set of mobile units, wherein each mobile unit in the set of mobile  
4 units includes a router to transmit and receive data packets from any other mobile  
5 unit in the set of mobile units, wherein each router is a home router to store and  
6 adjust home potentials of the home router, to receive and store neighbor potentials  
7 of neighboring routers, to determine ideal data packet flows using the home and  
8 neighbor potentials with an optimization of at least one of a merit function or a  
9 penalty function involving stochastic changes in topology in the spontaneous data  
10 communication network, and to receive and route data packets based on the home  
11 and neighbor potentials.

1

1 23. The system of claim 22, wherein at least one mobile unit in the set of  
2 mobile units includes a bus, an automobile, a bicycle, a motorcycle, a train, a  
3 trolley, a ferry, or a truck.

1